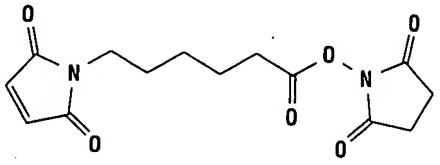
EMCS

Amine-sulfhydryl-reactive linker with low immunogenicity and a little more reach.



EMCS
M.W. 308.29
Spacer Arm 9.4 Å

Features/Benefits:

- NHS ester end couples with primary amines at pH 7-9 to form stable amide bonds
- Maleimides react with -SH groups at pH 6.5-7.5, forming stable thioether linkages
- Non-cleavable; water-insoluble
- Increased sphere of coupling vs. GMBS
- Aliphatic spacer offers low potential for eliciting an immune response
- *Reactive groups:* maleimide and NHS ester
- *Reactive toward:* sulfhydryl and amino groups
- Literature reference #'s 23, 68, 69 (pages 213-214)

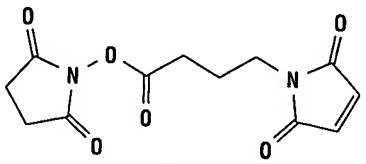
Ordering Information

Product #	Description	Pkg Size	U.S. Price
22308ZZ	EMCS* (*N*-[ε-Maleimidocaproyloxy]succinimide ester)	50 mg	$ 70

Sulfonated, water-soluble analog also available; see Sulfo-EMCS.

GMBS

Heterobifunctional analog of MBS – enhanced maleimide stability with less immunogenicity.



GMBS
M.W. 280.23
Spacer Arm 6.8 Å

Features/Benefits:

- Non-cleavable
- Low potential for eliciting an immune response, ensuring that the primary response to the antigen-carrier protein conjugate is not diluted by a response against a determinant on the cross-linker
- Less immunogenic than SMCC
- *Reactive groups:* NHS ester and maleimide
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #'s 23, 84 (pages 213-214)

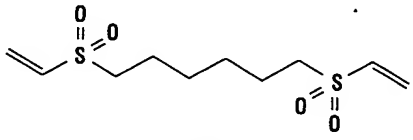
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22309ZZ	GMBS* (*N*-[γ-Maleimidobutyryloxy]succinimide ester)	50 mg	$ 70

Sulfonated, water-soluble analog also available; see Sulfo-GMBS.

HBVS

Sulfhydryl reactivity without the hydrolysis potential of maleimides.



HBVS
M.W. 266.38
Spacer Arm 14.7 Å

Features/Benefits:

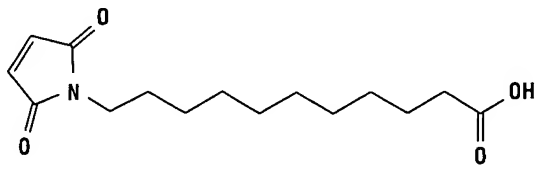
- Novel sulfhydryl-reactive, homobifunctional cross-linking agent
- Couples via Michael addition, yielding stable thioether links without stereoisomer formation
- Vinylsulfone-reactive group is indefinitely stable at pH 7 and resists hydrolytic degradation for days at pH 9
- Non-cleavable; water-insoluble
- *Reactive group:* vinylsulfone (homobifunctional)
- *Reactive toward:* sulfhydryl groups
- Literature reference #'s 78-80 (page 214)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22334ZZ	HBVS (1,6-Hexane-*bis*-vinylsulfone)	50 mg	$ 71

KMUA

Activate biomolecules for cross-linking through sulfhydryl groups or introduce carboxyl groups into proteins.



KMUA
M.W. 281.35
Spacer Arm 15.7 Å

Features/Benefits:

- Novel sulfhydryl-reactive, heterobifunctional cross-linking agent
- Maleimide activate protein/peptide via EDC activation of the carboxyl group
- Sulfhydryl modification agent that creates a terminal carboxylate group at -SH sites in proteins and other molecules
- Maleimide reacts with -SH groups at pH 6.5-7.5, forming stable thioether linkages
- Non-cleavable, long aliphatic cross-bridge
- Useful for preparing peptide-protein conjugates
- *Reactive groups:* maleimide and carboxyl
- *Reactive toward:* sulfhydryl and amino groups
- Literature reference #'s 63, 64 (page 214)

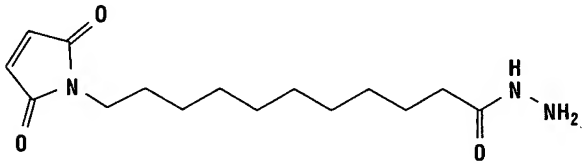
Ordering Information

Product #	Description	Pkg Size	U.S. Price
22111ZZ	**KMUA*** (*N*-κ-Maleimidoundecanoic acid)	100 mg	$ 29

See also: BMPA, EMCA.

KMUH

Extended chain length; heterobifunctional for the preparation of glycoconjugates.



KMUH
M.W. 295.38
Spacer Arm 19.0 Å

Features/Benefits:

- Sulfhydryl-reactive and carbonyl-reactive heterobifunctional cross-linking agent
- Long, non-cleavable, aliphatic cross-bridge
- Hydrazide group covalently couples to oxidized carbohydrate residues in glycoproteins and other glycoconjugates
- Maleimide reacts with -SH groups at pH 6.5-7.5, forming stable thioether linkages
- *Reactive groups:* maleimide and hydrazide
- *Reactive toward:* sulfhydryl and carbonyl (aldehyde)/ carboxyl groups
- Literature reference #67 (page 214)

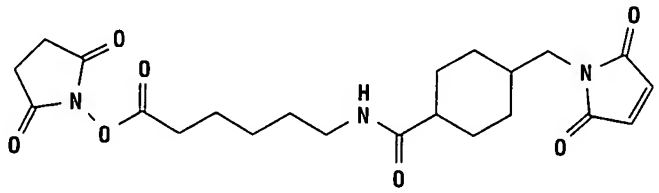
Ordering Information

Product #	Description	Pkg Size	U.S. Price
22111ZZ	**KMUH*** (*N*-[κ-Maleimidoundecanoic acid]hydrazide)	50 mg	$121

See also: BMPH, EMCH, M_2C_2H, MPBH, PDPH.

LC-SMCC

Extended chain length analog of SMCC, a popular reagent for immunoconjugate preparation.



LC-SMCC
M.W. 447.48
Spacer Arm 16.1 Å

Features/Benefits:

- Sulfhydryl-reactive and amine-reactive heterobifunctional cross-linking agent
- SMCC and analogs are ideal for coupling enzymes to antibodies as both enzyme activity and antibody specificity can be preserved after coupling
- NHS ester end couples with primary amines at pH 7-9 to form stable amide bonds
- Maleimide reacts with -SH groups at pH 6.5-7.5, forming stable thioether linkages
- Cyclohexane containing cross-bridge stabilizes the maleimide group
- Non-cleavable; water-insoluble
- Useful for the preparation of stable maleimide activated proteins
- *Reactive groups:* NHS ester and maleimide
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #'s 35, 52, 70 (pages 213-214)

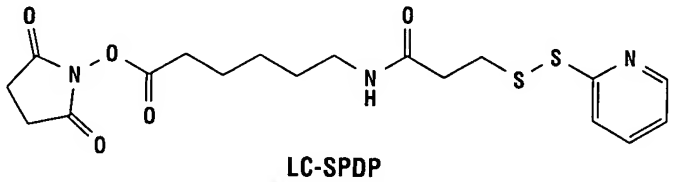
Ordering Information

Product #	Description	Pkg Size	U.S. Price
22362ZZ	**LC-SMCC*** (Succinimidyl-4-[*N*-maleimidomethyl]-cyclohexane-1-carboxy-[6-amidocaproate])	50 mg	$ 89

See also: SMCC, Sulfo-SMCC.

LC-SPDP

Classic heterobifunctional, cleavable cross-linker, with an extended spacer arm.



LC-SPDP
M.W. 425.52
Spacer Arm 15.7 Å

Features/Benefits:

- LC-SPDP releases a detectable byproduct after reacting with a free sulfhydryl group; by measuring the release of pyridine-2-thione at 343 nm, the reaction can be easily followed
- *Reactive groups:* pyridyldithio and NHS ester
- *Reactive toward:* sulfhydryl and amino groups
- Literature reference #'s 33, 38 (page 213)

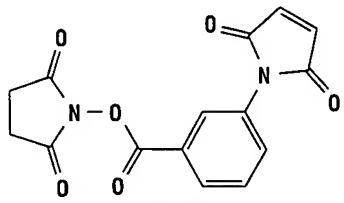
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
21651ZZ	**LC-SPDP*** (Succinimidyl 6-[3-(2-pyridyldithio)-propionamido]hexanoate)	50 mg	$245

Sulfonated, water-soluble analog also available; see Sulfo-LC-SPDP.

MBS

Useful for coupling proteins, enzymes to antibodies, toxins to antibodies, and haptens to carrier proteins.



MBS
M.W. 314.25
Spacer Arm 9.9 Å

Features/Benefits:
- Water-insoluble
- Non-cleavable

- Popular for forming enzyme immunoconjugates
- *Reactive groups:* NHS ester and maleimide
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #'s 25, 42, 84 (pages 213-214)

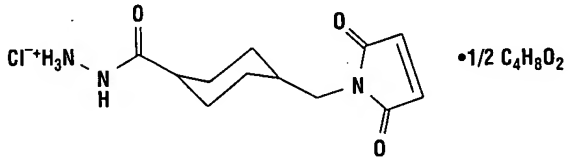
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22311ZZ	MBS* (*m*-Maleimidobenzoyl-*N*-hydroxysuccinimide ester)	50 mg	$ 41

Sulfonated, water-soluble analog also available; see Sulfo-MBS.
See also: SMPB.

M_2C_2H

Combine carbohydrate selectivity with sulfhydryl reactivity.



M_2C_2H
M.W. 331.8
Spacer Arm 15.1 Å

Features/Benefits:
- Has an oxidized carbohydrate-specific hydrazide, a sulfhydryl-reactive group and spacer arm to accommodate a wide range of molecular coupling demands
- Sulfhydryl-specific group is a maleimide that yields a thioether linkage upon coupling
- Stable in acetonitrile

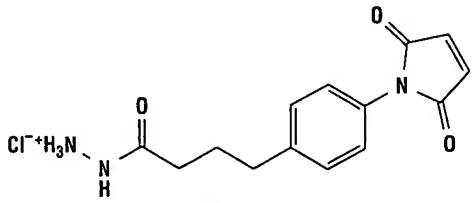
- *Reactive groups:* hydrazide and maleimide
- *Reactive toward:* carbohydrate and sulfhydryl groups
- Literature reference #26 (page 213)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22303ZZ	M_2C_2H (4-[*N*-Maleimidomethyl]cyclohexane-1-carboxylhydrazide•HCl•1/2 dioxane)	50 mg	$107

MPBH

Carbohydrate-selective and sulfhydryl-reactive.



MPBH
M.W. 309.75
Spacer Arm 17.9 Å

Features/Benefits:
- Has an oxidized carbohydrate-specific hydrazide, a sulfhydryl-reactive group and spacer arm to accommodate a wide range of molecular coupling demands

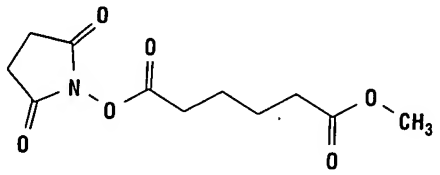
- Sulfhydryl-specific group is a maleimide that yields a thioether linkage upon coupling
- Stable in DMSO
- *Reactive groups:* hydrazide and maleimide
- *Reactive toward:* carbohydrate and sulfhydryl groups
- Literature reference #26 (page 213)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22305ZZ	MPBH (4-[4-*N*-Maleimidophenyl]butyric acid hydrazide•HCl)	50 mg	$104

MSA

Amine-reactive with latent carboxyl group.



MSA
M.W. 257.24
Spacer Arm 7.2 Å

Features/Benefits:

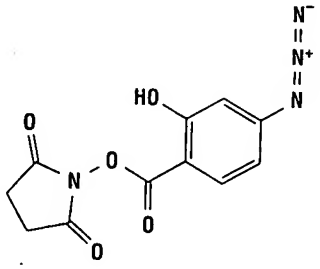
- Amine-reactive modification reagent containing a masked carboxyl group
- NHS ester reacts with primary amines at pH 7-9 to form stable amide bonds
- Masked carboxyl group containing heterobifunctional reagent
- Converts amino groups to carboxyl groups
- Carboxyl group freed at pH 9.5 in phosphate buffer
- Non-cleavable; water-insoluble
- *Reactive groups:* NHS ester and methyl ester
- *Reactive toward:* amino groups

Ordering Information

Product #	Description	Pkg Size	U.S. Price
22605ZZ	MSA (Methyl *N*-succinimidyl adipate)	50 mg	$ 45

NHS-ASA

An ^{125}I label can be easily and effectively incorporated into this reagent before the acylation step, and used to radiolabel conjugates.



NHS-ASA
M.W. 276.21
Spacer Arm 8.0 Å

Features/Benefits:

- Photolysis reaction is readily initiated by long wave UV light
- NHS-ASA has been used to simplify detection of photo-affinity labeled complexes and the determination of cross-linked loci
- *Reactive groups:* hydroxyphenyl azide and NHS ester
- *Reactive toward:* amino groups
- Literature reference #27 (page 213)

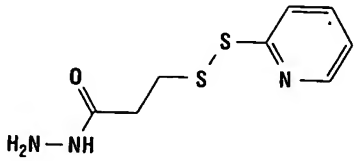
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
27714ZZ	NHS-ASA* (*N*-Hydroxysuccinimidyl-4-azidosalicylic acid)	50 mg	$ 65

Sulfonated, water-soluble analogs also available; see Sulfo-NHS-ASA and Sulfo-LC-NHS-ASA.

PDPH

A cleavable, carbohydrate-selective, sulfhydryl-reactive cross-linker.



PDPH
M.W. 229.32
Spacer Arm 9.2 Å

Features/Benefits:

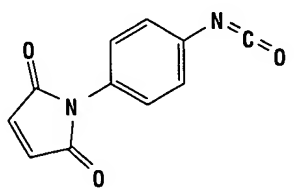
- Pyridyl disulfide group of PDPH gives a cleavable disulfide linkage in the conjugate
- An oxidized carbohydrate-specific hydrazide
- *Reactive groups:* pyridyldithio and hydrazide
- *Reactive toward:* sulfhydryl groups and carbohydrate
- Literature reference #'s 28, 76, 77 (pages 213-214)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22301ZZ	PDPH (3-[2-Pyridyldithio]propionyl hydrazide)	50 mg	$102

PMPI

Both hydroxyl and sulfhydryl reactivity can be found in this unique cross-linker.



PMPI
M.W. 214.18
Spacer Arm 8.7 Å

Features/Benefits:

- Novel sulfhydryl- and hydroxyl-reactive heterobifunctional cross-linker
- Maleimide reacts with -SH groups at pH 6.5-7.5, forming stable thioether linkages
- Isocyanate reacts with -OH groups to form a carbamate link at pH 8.5
- Non-cleavable
- Excellent tool for the preparation of conjugates of -OH group containing compounds such as steroids and vitamins
- *Reactive groups:* maleimide and isocyanate
- *Reactive toward:* sulfhydryl and hydroxyl groups
- Literature reference #71 (page 214)

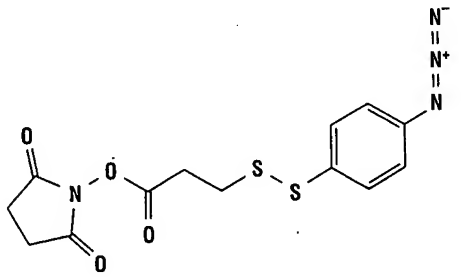
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
28100ZZ	**PMPI*** (*N*-[*p*-Maleimidophenyl]isocyanate)	50 mg	$ 86

See also: BMPA, EMCA.

SADP

Versatile, cleavable and photoreactive cross-linker.



SADP
M.W. 352.39
Spacer Arm 13.9 Å

Features/Benefits:

- Cleavable by 50 mM dithiothreitol, 100 mM β-mercaptoethanol or 1% sodium borohydride
- Photolysis is achieved by irradiation at 265-275 nm
- *Reactive groups:* phenylazide and NHS ester
- *Reactive toward:* amino groups
- Literature reference #53 (page 214)

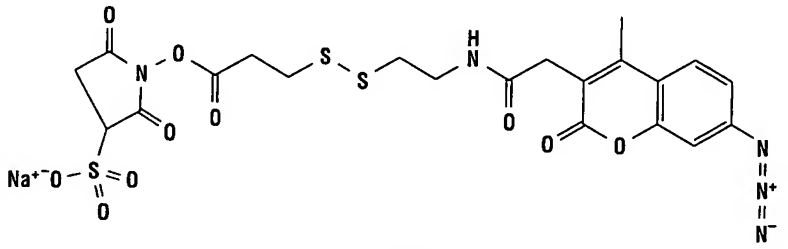
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
21533ZZ	**SADP*** (*N*-Succinimidyl [4-azidophenyl]-1,3′-dithiopropionate)	50 mg	$ 73

Sulfonated, water-soluble analog also available; see Sulfo-SADP.

SAED

Cleavable and photoreactive – a safer, easier alternative to radiolabeling proteins.



SAED
M.W. 621.60
Spacer Arm 23.6 Å

Features/Benefits:

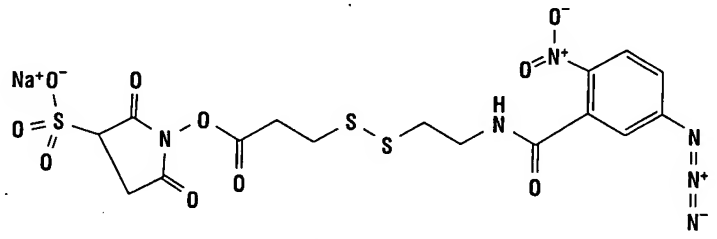
- *N*-sulfosuccinimidyl ester terminal of SAED will react with amino groups of one protein; the phenyl azide terminal can be reacted nonspecifically under ultraviolet conditions to link a second protein
- Disulfide bond of SAED may be cleaved with an appropriate reducing agent
- *Reactive groups:* azido-methylcoumarin and Sulfo-NHS ester
- *Reactive toward:* amino groups
- Literature reference #54 (page 214)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
33030ZZ	**SAED** (Sulfosuccinimidyl 2-[7-azido-4-methyl-coumarin-3-acetamido]ethyl-1,3′-dithiopropionate)	5 mg	$103

SAND

Water-soluble, long chain, cleavable analog of ANB-NOS.



SAND
M.W. 570.51
Spacer Arm 18.5 Å

Features/Benefits:

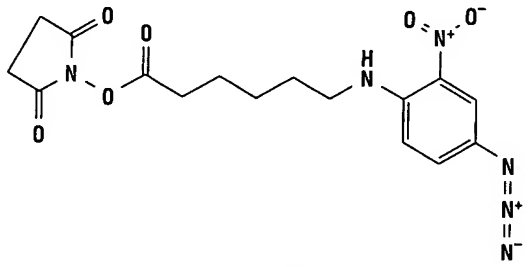
- Cleavable by thiols
- Nitro group on the phenyl azide allows for photolysis at 320-350 nm
- *Reactive groups:* Sulfo-NHS ester and nitrophenyl azide
- *Reactive toward:* amino groups
- Literature reference #29 (page 213)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
21549ZZ	**SAND** (Sulfosuccinimidyl 2-[*m*-azido-*o*-nitro-benzamido]ethyl-1,3′-dithiopropionate)	50 mg	$131

SANPAH

Extended chain length, photoactivatable cross-linker.



SANPAH
M.W. 390.35
Spacer Arm 18.2 Å

Features/Benefits:

- Optimal photolysis occurs at 320-350 nm; a condition that limits damage to biomolecules by irradiation

- *Reactive groups:* nitrophenyl azide and NHS ester
- *Reactive toward:* amino groups
- Literature reference #30 (page 213)

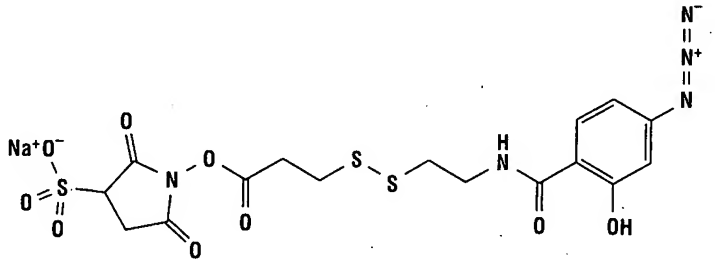
Ordering Information

Product #	Description	Pkg. Size	U. Pr
22600ZZ	**SANPAH*** (*N*-Succinimidyl 6-[4′-azido-2′-nitro-phenylamino]hexanoate)	50 mg	$

Sulfonated, water-soluble analog also available; see Sulfo-SANPAH.

SASD

Transfers a radioactive label from one protein to another.



SASD
M.W. 541.51
Spacer Arm 18.9 Å

Features/Benefits:

- Radioiodinatable,* cleavable, photoreactive, heterobifunctional cross-linker
- Iodination occurs between the azide and the hydroxyl groups of the phenyl ring; after cleavage by a reducing agent, the radioactive label will remain attached to the protein conjugated by photolysis

- *Reactive groups:* hydroxyphenyl azide and Sulfo-NHS este
- *Reactive toward:* amino groups
- Literature reference #'s 31, 51 (pages 213-214)

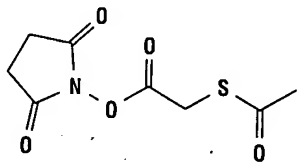
Ordering Information

Product #	Description	Pkg. Size	U. Pr
27716ZZ	**SASD** (Sulfosuccinimidyl-2-[*p*-azido-salicylamido]ethyl-1,3′-dithiopropionate)	50 mg	$1

See IODO-GEN® Iodination Reagent (Product #'s 28600ZZ and 28601ZZ).

SATA

Adds protected sulfhydryls for better control when a sulfhydryl group is needed in conjugate formation.



SATA
M.W. 231.23
Spacer Arm 2.8 Å

Features/Benefits:

- Reacts with amines to add protected sulfhydryl groups
- NHS ester end couples with primary amines at pH 7-9 to form stable amide bonds
- Converts amino groups to sulfhydryl groups
- Latent -SH group is released by hydroxylamine and is available for reaction with maleimide-activated biomolecules or other -SH group-containing compounds
- Cross-links formed with other -SH group-containing molecules are reversible by reducing agents
- *Reactive groups:* NHS ester and thioacetyl-protected sulfhydryl
- *Reactive toward:* amino and maleimide/iodoacetyl or vinyl sulfone
- Literature reference #72 (page 214)

Ordering Information

Product #	Description	Pkg Size	U.S. Price
26102ZZ	SATA* (*N*-Succinimidyl S-acetylthioacetate)	50 mg	$ 30

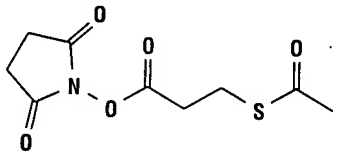
**See also: SATP.*

Compatible Pierce Products for Use With SATA and SATP

20688ZZ	DMSO	950 ml	$ 29
26103ZZ	Hydroxylamine•HCl	25 gm	$ 28

SATP

Same function as SATA, but offers more steric freedom for the unmasked sulfhydryl group.



SATP
M.W. 245.25
Spacer Arm 4.1 Å

Features/Benefits:

- Thiolation reagent that reacts with amines to add protected sulfhydryl groups
- Converts amino groups to sulfhydryl groups
- NHS ester end couples with primary amines at pH 7-9 to form stable amide bonds
- Latent -SH group is released by hydroxylamine treatment and available for reaction with maleimide-activated biomolecules or other -SH group-containing compounds
- Cross-links formed with other -SH group-containing molecules are reversible by reducing agents
- Modify peptides to facilitate the preparation of hapten-carrier conjugates
- *Reactive groups:* NHS ester and thioacetyl-protected sulfhydryl
- *Reactive toward:* amino and maleimide/iodoacetyl or vinyl sulfone
- Literature reference #'s 72, 81 (page 214)

Ordering Information

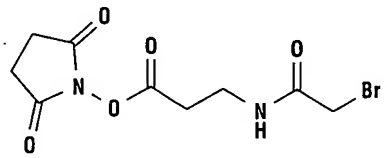
Product #	Description	Pkg Size	U.S. Price
26100ZZ	SATP (*N*-Succinimidyl S-acetylthiopropionate)	50 mg	$ 49

Compatible Pierce Products for Use With SATP

20688ZZ	DMSO	950 ml	$ 29
26103ZZ	Hydroxylamine•HCl	25 gm	$ 28

SBAP

Alternative active halogen chemistry applied to the preparation of cyclic peptides and peptide conjugates.



SBAP
M.W. 307.10
Spacer Arm 6.2 Å

Features/Benefits:

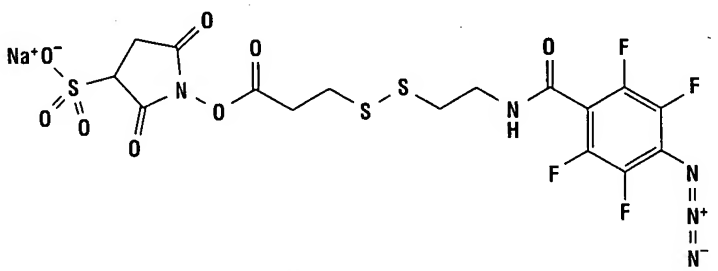
- NHS ester reacts with primary amines at pH 7-9 to form a stable amide bond
- Bromoacetyl group reacts with sulfhydryl groups at pH > 7.5 to form stable thioether bonds
- Spacer maintains peptide-like character in the cross-linked species
- Resulting cross-link is susceptible to acid hydrolysis
- *Reactive groups:* NHS ester and bromoacetyl
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #73 (page 214)

Ordering Information

Product #	Description	Pkg Size	U.S. Price
22339ZZ	**SBAP** (Succinimidyl 3-[bromoacetamido]propionate)	50 mg	$ 72

SFAD

Significantly improved photoconjugation efficiency over typical aryl azide-containing cross-linkers.



SFAD
M.W. 597.48
Spacer Arm 14.6 Å

Features/Benefits:

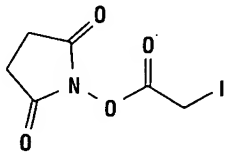
- Water-soluble; cleavable
- Perfluorophenyl azide moiety photolyzes at 320 nm
- Insertion efficiency approximately 70%
- Improved stability of the singlet perfluoroaryl nitrene reactive intermediate allows high-efficiency insertion with -CH bonds vs. low efficiency ring expansion with amine nucleophiles, typical of nonfluorinated aryl nitrenes
- ^{19}F NMR can be used to monitor perfluoroaryl moiety transfer from one protein to another
- *Reactive groups:* Sulfo-NHS ester and perfluoroaryl azide moiety
- *Reactive toward:* amino groups and -CH bonds
- Literature reference #'s 82, 83 (page 214)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
27719ZZ	**SFAD** (Sulfosuccinimidyl-[perfluoroazidobenzamido]-ethyl-1,3′-dithiopropionate)	50 mg	$109

SIA

Suited to capturing amine and sulfhydryl groups in very close proximity.



SIA
M.W. 283.02
Spacer Arm 1.5 Å

Features/Benefits:
- Shortest sulfhydryl-reactive and amine-reactive heterobifunctional cross-linker available
- Non-cleavable; close proximity cross-linking agent

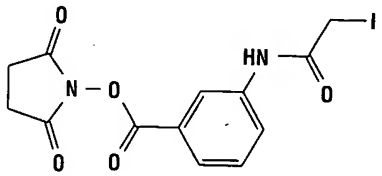
- NHS ester reacts with primary amines at pH 7-9 to form a stable amide bond
- Iodoacetyl group reacts with sulfhydryl groups at pH > 7.5 to form stable thioether bond
- *Reactive groups:* NHS ester and iodoacetyl
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #'s 74, 75 (page 214)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22349ZZ	**SIA** (*N*-Succinimidyl iodoacetate)	50 mg	$ 39

SIAB

Popular alternative for making enzyme-antibody conjugates; reactive toward amines and sulfhydryls.



SIAB
M.W. 402.14
Spacer Arm 10.6 Å

Features/Benefits:
- Used to prepare stable enzyme-IgG conjugates
- Forms conjugates with liposomes

- *Reactive groups:* iodoacetyl and NHS ester
- *Reactive toward:* sulfhydryl and amino groups
- Literature reference #'s 33, 34 (page 213)

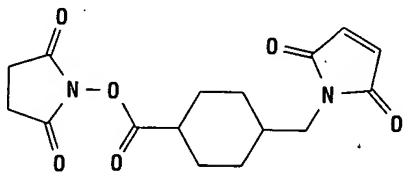
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22329ZZ	**SIAB*** (*N*-Succinimidyl[4-iodoacetyl]aminobenzoate)	50 mg	$ 89

***Sulfonated, water-soluble analog also available; see Sulfo-SIAB.**
See also: SIA, SBAP.

SMCC

Provides stable activated proteins.



SMCC
M.W. 334.32
Spacer Arm 11.6 Å

Features/Benefits:
- Cyclohexane bridge gives extra stability to the maleimide-reactive group; *N*-(4-carboxycyclohexylmethyl) maleimide groups are stable for 64 hours (in 0.1 M sodium phosphate buffer, pH 7.0 at 4°C)

- Ideal for coupling enzymes to antibodies; both the enzyme activity and antibody specificity can be preserved after coupling
- *Reactive groups:* NHS ester and maleimide
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #'s 35, 52, 84, 89 (pages 213-214)

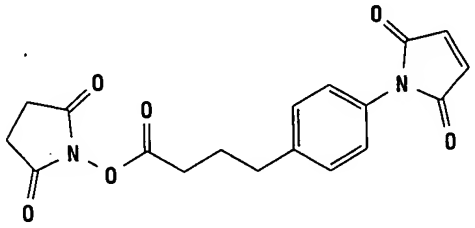
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22360ZZ	**SMCC*** (Succinimidyl 4-[*N*-maleimidomethyl]-cyclohexane-1-carboxylate)	50 mg	$ 54

***Sulfonated, water-soluble analog also available; see Sulfo-SMCC.**
See also: AMAS, BMPS, MBS, SMPB, SMPH.

SMPB

Features extended chain length to limit steric hindrance.



SMPB
M.W. 356.33
Spacer Arm 11.6 Å

Features/Benefits:
- Extended chain analog of MBS
- Conjugates formed with SMPB were shown to be more stable in serum than SPDP conjugates

- *Reactive groups:* NHS ester and maleimide
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #'s 36, 84 (pages 213-214)

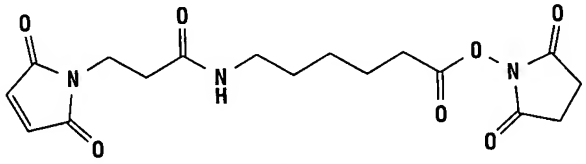
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22416ZZ	SMPB* (Succinimidyl 4-[*p*-maleimidophenyl]-butyrate)	50 mg	$ 65

Sulfonated, water-soluble analog also available; see Sulfo-SMPB.

SMPH

Spacer arm longer than that of SMPB, minimizing steric hindrance.



SMPH
M.W. 379.36
Spacer Arm 14.3 Å

Features/Benefits:
- Amine- and sulfhydryl-reactive heterobifunctional cross-linker
- NHS ester reacts with primary amines at pH 7-9 to form a stable amide bond

- Maleimide reacts with -SH groups at a pH of 6.5-7.5, forming stable thioether bond
- Non-cleavable; water-insoluble
- More hydrophilic character to the cross-bridge than BMPS, GMBS, EMCS or SMPB
- *Reactive groups:* maleimide and NHS ester
- *Reactive toward:* sulfhydryl and amino groups
- Literature reference #'s 74, 75 (page 214)

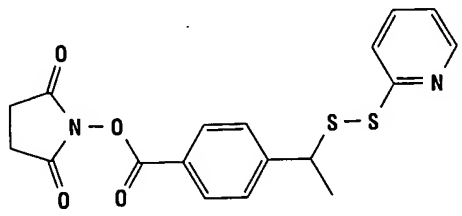
Ordering Information

Product #	Description	Pkg Size	U.S. Price
22363ZZ	SMPH* (Succinimidyl-6-[(β-maleimidopropionamido) hexanoate])	50 mg	$ 89

See also: BMPS, GMBS, EMCS, SMPB.

SMPT

***Forms cleavable immunotoxins with greater stability* in vivo.**



SMPT
M.W. 388.46
Spacer Arm 20.0 Å

Features/Benefits:
- Contains a hindered disulfide bond; has formed immunotoxins with improved stability

- *In vitro*, an SMPT conjugate was as effective as conjugates formed with SPDP and 2-Iminothiolane
- Does not require exposing the antibody to reducing agents
- *Reactive groups:* NHS ester and pyridyldithio
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #37 (page 213)

Ordering Information

Product #	Description	Pkg. Size	U.S. Pric
21558ZZ	SMPT* (4-Succinimidyloxycarbonyl-methyl-α [2-pyridyldithio]toluene)	50 mg	$16

Sulfonated, long chain water-soluble analog also available; see Sulfo-LC-SMPT.

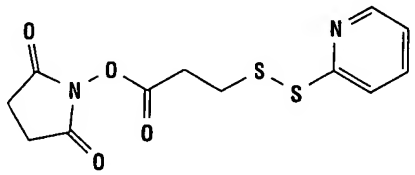
SPB

Amine-reactive DNA intercalating agent that has applications in cross-linking protein to DNA and photoimmobilizing compounds onto microwell plates.

See Product # 23013ZZ, (Succinimidyl-[4-(psoralen-8-yloxy)]butyrate), in Section 3-4, page 224.

SPDP

Classic heterobifunctional, cleavable cross-linker.



SPDP
M.W. 312.37
Spacer Arm 6.8 Å

Features/Benefits:

- Widely used in immunochemistry; conjugates used in drug carrier systems, antibody production and enzyme immunoassays have been successfully prepared with SPDP
- SPDP can be used as a protein thiolation reagent, resulting in available -SH groups
- *Reactive groups:* NHS ester and pyridyldithio
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #'s 38, 86 (pages 213-214)

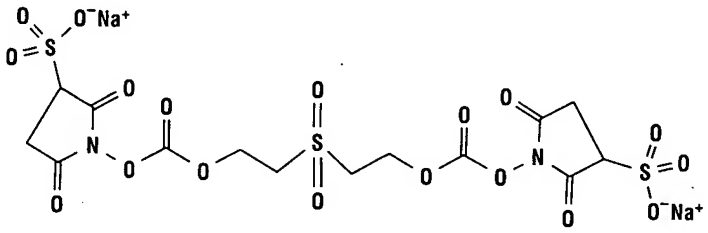
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
21857ZZ	SPDP* (*N*-Succinimidyl 3-[2-pyridyldithio]propionate)	50 mg	$ 85

See: LC-SPDP, Sulfo-LC-SPDP.
See also: SATA, SATP (protein thiolation reagents).

Sulfo-BSOCOES

Water-soluble, base-reversible analog of BSOCOES.



Sulfo-BSOCOES
M.W. 640.44
Spacer Arm 13.0 Å

Features/Benefits:

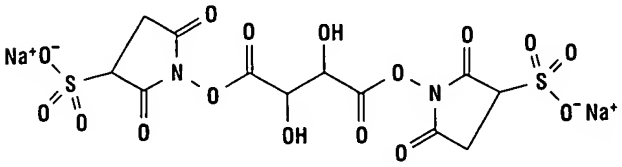
- Water-soluble
- Base-cleavable (pH 11.6, 2 hours, 37°C)
- *Reactive groups:* Sulfo-NHS ester (homobifunctional)
- *Reactive toward:* amino groups
- Literature reference #39 (page 213)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
21556ZZ	**Sulfo-BSOCOES** (*Bis*[2-(Sulfosuccinimidooxycarbonyloxy)-ethyl]sulfone)	50 mg	$103

Sulfo-DST

Water-soluble analog of DST; cleavable by oxidizing agents.



Sulfo-DST
M.W. 548.32
Spacer Arm 6.4 Å

- *Reactive groups:* Sulfo-NHS ester (homobifunctional)
- *Reactive toward:* amino groups
- Literature reference #40 (page 213)

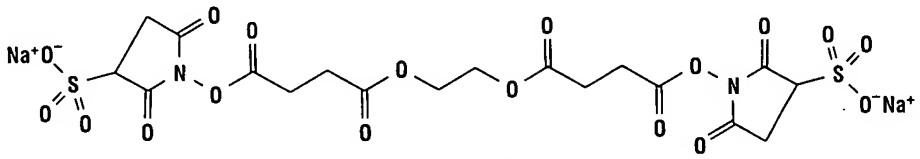
Features/Benefits:
- Ideal for applications in which a cross-link reversibility is desired without disturbing protein S-S bonds

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
20591ZZ	Sulfo-DST (Disulfosuccinimidyl tartrate)	50 mg	$ 98

Sulfo-EGS

Water-soluble and cleavable – without harsh reducing agents.



Sulfo-EGS
M.W. 660.45
Spacer Arm 16.1 Å

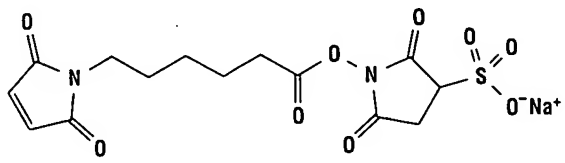
Features/Benefits:
- Cross-links formed are cleavable at pH 8.5 using hydroxylamine for three to six hours at 37°C
- Lactose dehydrogenase retained 60% of its activity after reversible cross-linking with EGS
- *Reactive groups:* Sulfo-NHS esters (homobifunctional)
- *Reactive toward:* amino groups
- Literature reference #41 (page 213)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
21566ZZ	Sulfo-EGS (Ethylene glycol *bis*[sulfosuccinimidylsuccinate])	50 mg	$ 95

Sulfo-EMCS

Water-soluble, low immunogenicity and a little more reach.



Sulfo-EMCS
M.W. 410.33
Spacer Arm 9.4 Å

- Non-cleavable
- Increased sphere of coupling vs. Sulfo-GMBS
- Aliphatic spacer offers low potential for eliciting an immune response
- *Reactive groups:* maleimide and Sulfo-NHS ester
- *Reactive toward:* sulfhydryl and amino groups
- Literature reference #'s 23, 68, 69 (pages 213-214)

Features/Benefits:
- Sulfonated analog of EMCS has improved solubility in aqueous buffer systems
- Sulfo-NHS ester end couples with primary amines at pH 7-9 to form stable amide bonds
- Maleimide reacts with -SH groups at pH 6.5-7.5, forming stable thioether linkages

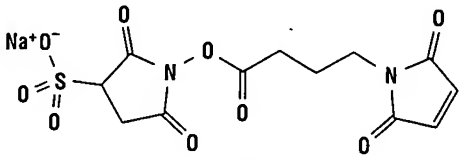
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22307ZZ	Sulfo-EMCS* (*N*-[ε-Maleimidocaproyloxy] sulfosuccinimide ester)	50 mg	$149

***Non-sulfonated, water-insoluble analog also available; see EMCS.**
See also: Sulfo-GMBS and Sulfo-KMUS.

Sulfo-GMBS

Sulfonated analog of GMBS offers water solubility, enhanced stability with less immunogenicity.



Sulfo-GMBS
M.W. 382.28
Spacer Arm 6.8 Å

Features/Benefits:

- Non-cleavable, membrane-impermeable
- Has a low potential for eliciting an immune response, ensuring that the primary response to the antigen-carrier protein conjugate is not diluted by a response against a determinant on the cross-linker
- GMBS and Sulfo-GMBS are reported to be less immunogenic than SMCC
- Sulfo-GMBS has improved solubility in water and aqueous buffer systems
- *Reactive groups:* maleimide and Sulfo-NHS ester
- *Reactive toward:* sulfhydryl and amino groups
- Literature reference #23 (page 213)

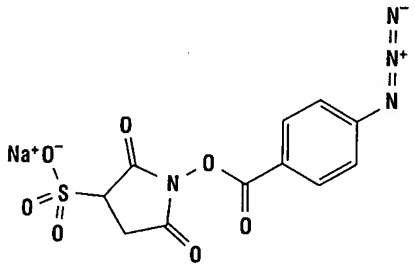
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22324ZZ	**Sulfo-GMBS*** (*N*-[γ-Maleimidobutyryloxy]sulfo-succinimide ester)	50 mg	$137

See also: Sulfo-EMCS, Sulfo-KMUS, Sulfo-MBS.

Sulfo-HSAB

Water-soluble, amine-reactive, photoreactive cross-linker.



Sulfo-HSAB
M.W. 362.25
Spacer Arm 9.0 Å

Features/Benefits:

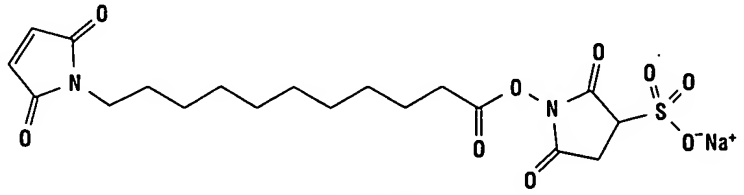
- Useful for the preparation of conjugates for the purpose of producing antibodies
- *Reactive groups:* phenyl azide and Sulfo-NHS ester
- *Reactive toward:* amino groups
- Literature reference #'s 24, 30 (page 213)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
21563ZZ	**Sulfo-HSAB** (*N*-Hydroxysulfosuccinimidyl-4-azidobenzoate)	50 mg	$ 54

Sulfo-KMUS

Water-soluble, long chain heterobifunctional cross-linker.



Sulfo-KMUS
M.W. 480.47
Spacer Arm 15.7 Å

Features/Benefits:

- Non-cleavable extended aliphatic cross-bridge
- Water-soluble with enhanced sphere of coupling
- Sulfo-NHS ester reacts with primary amines at pH 7-9 to form a stable amide bond
- Maleimide reacts with -SH groups at pH 6.5-7.5, forming a stable thioether bond
- *Reactive groups:* maleimide and Sulfo-NHS ester
- *Reactive toward:* sulfhydryl and amino groups
- Literature reference #23 (page 213)

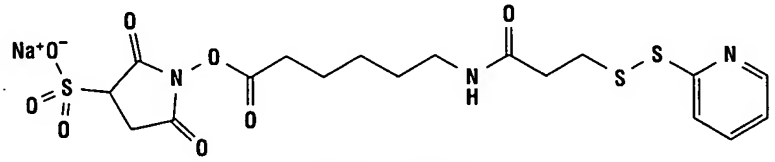
Ordering Information

Product #	Description	Pkg Size	U.S. Price
21111ZZ	Sulfo-KMUS* (*N*-[κ-Maleimidoundecanoyloxy]-sulfosuccinimide ester)	50 mg	$159

See also: Sulfo-GMBS, Sulfo-EMCS.

Sulfo-LC-SPDP

Classic water-soluble, heterobifunctional, cleavable cross-linker.



Sulfo-LC-SPDP
M.W. 527.57
Spacer Arm 15.6 Å

Features/Benefits:

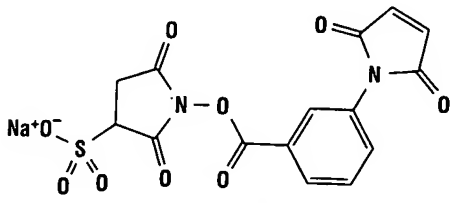
- Sulfo-LC-SPDP releases a detectable byproduct after reacting with free sulfhydryl groups; by measuring the release of pyridine-2-thione at 343 nm, the reaction can be easily followed
- *Reactive groups:* pyridyldithio and Sulfo-NHS ester
- *Reactive toward:* sulfhydryl and amino groups
- Literature reference #'s 38, 85 (pages 213-214)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
21650ZZ	Sulfo-LC-SPDP (Sulfosuccinimidyl 6-[3′-(2-pyridyldithio)-propionamido]hexanoate)	50 mg	$257

Sulfo-MBS

Useful for coupling proteins, enzymes to antibodies, toxins to antibodies, and haptens to carrier proteins.



Sulfo-MBS
M.W. 416.30
Spacer Arm 9.9 Å

Features/Benefits:
- Water-soluble; non-cleavable
- Membrane-impermeable
- *Reactive groups:* Sulfo-NHS ester and maleimide
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #42 (page 213)

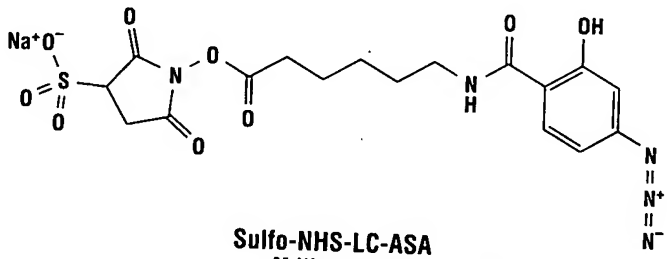
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22312ZZ	Sulfo-MBS* (*m*-Maleimidobenzoyl-*N*-hydroxysulfo-succinimide ester)	50 mg	$ 94

See also: Sulfo-EMCS, Sulfo-GMBS, Sulfo-KMUS.

Sulfo-NHS-LC-ASA

An ^{125}I label can be easily and effectively incorporated into this reagent before the acylation step and used to radiolabel conjugates.



Sulfo-NHS-LC-ASA
M.W. 491.41
Spacer Arm 18.0 Å

Features/Benefits:
- Photolysis reaction is readily initiated by long wave UV light
- Simplifies detection of photoaffinity labeled complexes and the determination of cross-linked loci
- Sulfo-NHS-LC-ASA is water-soluble, and has a long spacer arm to overcome steric restraints
- *Reactive groups:* hydroxy phenyl azide and Sulfo-NHS ester
- *Reactive toward:* amino groups
- Literature reference #27 (page 213)

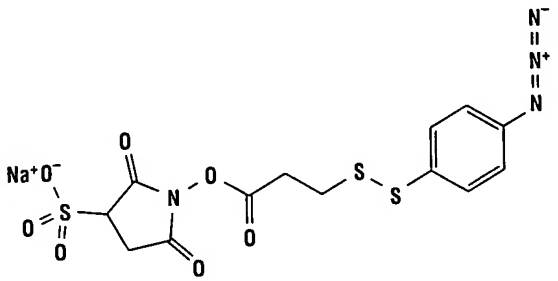
Ordering Information

Product #	Description	Pkg. Size	U.S. Price
27735ZZ	Sulfo-NHS-LC-ASA* (Sulfosuccinimidyl[4-azidosalicylamido]-hexanoate)	50 mg	$225

See also: SASD.

Sulfo-SADP

Highly versatile, water-soluble, cleavable and photoreactive cross-linker.



Sulfo-SADP
M.W. 454.44
Spacer Arm 13.9 Å

Features/Benefits:

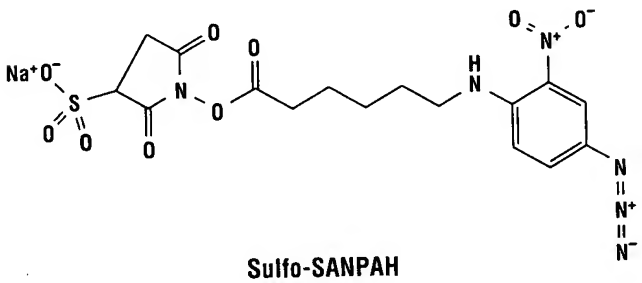
- Cleavable by 50 mM dithiothreitol, 100 mM β-mercaptoethanol or 1% sodium borohydride
- Photolysis is achieved by irradiation at 265-275 nm
- *Reactive groups:* phenyl azide and Sulfo-NHS ester
- *Reactive toward:* amino groups
- Literature reference #20 (page 213)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
21553ZZ	Sulfo-SADP (Sulfosuccinimidyl[4-azidophenyldithio]-propionate)	50 mg	$125

Sulfo-SANPAH

Extended chain length, photoactivatable cross-linker.



Sulfo-SANPAH
M.W. 492.40
Spacer Arm 18.2 Å

Features/Benefits:

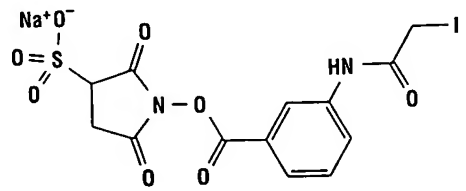
- Optimal photolysis occurs at 320-350 nm, a condition that limits damage to biomolecules by irradiation
- Water-soluble; non-cleavable
- *Reactive groups:* nitrophenyl azide and Sulfo-NHS ester
- *Reactive toward:* amino groups
- Literature reference #30 (page 213)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22589ZZ	Sulfo-SANPAH (Sulfosuccinimidyl 6-[4′-azido-2′-nitro-phenylamino]hexanoate)	50 mg	$139

Sulfo-SIAB

Popular alternative for making enzyme-antibody conjugates – reactive toward amines and sulfhydryls.



Sulfo-SIAB
M.W. 504.19
Spacer Arm 10.6 Å

Features/Benefits:

- *Reactive groups:* iodoacetate and Sulfo-NHS ester
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #45 (page 214)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22327ZZ	Sulfo-SIAB (Sulfosuccinimidyl[4-iodoacetyl]aminobenzoate)	50 mg	$ 99

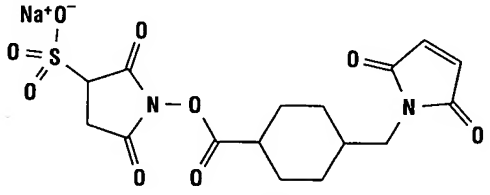
Special Product

Sulfo-SMCC

Provides stable activated proteins.

Features/Benefits:

- Water-soluble, non-cleavable and membrane-impermeable
- Cyclohexane bridge gives extra stability to the maleimide-reactive group; *N*-(4-carboxycyclohexylmethyl)maleimide groups are stable for 64 hours (in 0.1 M sodium phosphate buffer, pH 7.0 at 4°C)
- Ideal for coupling enzymes to antibodies; both the enzyme activity and antibody specificity can be preserved after coupling
- *Reactive groups:* Sulfo-NHS ester and maleimide
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #46 (page 214)



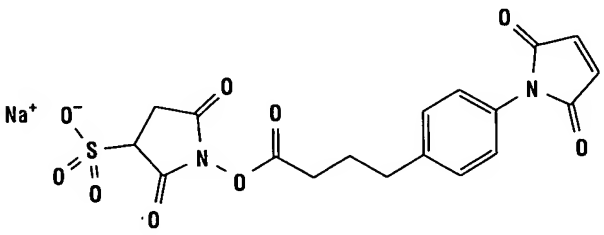
Sulfo-SMCC
M.W. 436.37
Spacer Arm 11.6 Å

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22322ZZ	**Sulfo-SMCC** (Sulfosuccinimidyl 4-[*N*-maleimidomethyl]-cyclohexane-1-carboxylate)	50 mg	**$104**

Sulfo-SMPB

Extended chain length analog of Sulfo-MBS.



Sulfo-SMPB
M.W. 458.38
Spacer Arm 14.5 Å

- Membrane-impermeable
- *Reactive groups:* Sulfo-NHS ester and maleimide
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #'s 36, 47 (pages 213-214)

Features/Benefits:

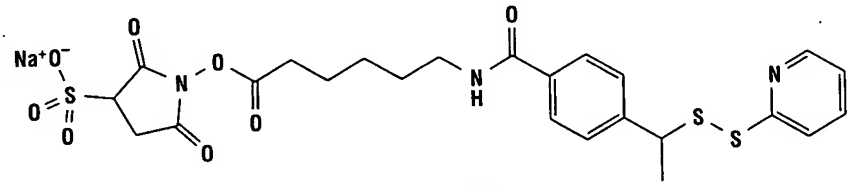
- Extended chain length limits steric hindrance
- Water-soluble; non-cleavable

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
22317ZZ	Sulfo-SMPB (Sulfosuccinimidyl 4-[*p*-maleimidophenyl]-butyrate)	50 mg	$101

Sulfo-LC-SMPT

***Form cleavable immunotoxins with greater stability* in vivo.**



Sulfo-LC-SMPT
M.W. 603.67
Spacer Arm 20.0 Å

Features/Benefits:

- Contains a hindered disulfide bond; has formed immunotoxins with improved stability
- *In vitro,* SMPT conjugates are as effective as conjugates formed with SPDP and 2-Iminothiolane
- Does not require exposing the antibody to reducing agents
- Offers an extended spacer arm and water solubility

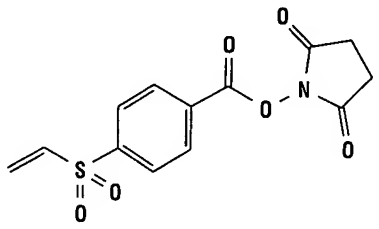
- *Reactive groups:* Sulfo-NHS ester and pyridyldithio
- *Reactive toward:* amino and sulfhydryl groups
- Literature reference #48 (page 214)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
21568ZZ	Sulfo-LC-SMPT (Sulfosuccinimidyl-6-[α-methyl-α-(2-pyridyldithio)toluamido]hexanoate)	50 mg	$229

SVSB

Combines the advantages of the vinylsulfone-reactive group with those of the classical NHS ester.



SVSB
M.W. 309.30
Spacer Arm 8.3 Å

Features/Benefits:

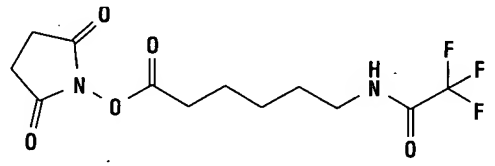
- Novel heterobifunctional reagent containing an amine-reactive NHS and a sulfhydryl-reactive vinylsulfone
- Non-cleavable; water-insoluble
- NHS ester reacts with primary amines at pH 7-9 to form a stable amide bond
- Vinylsulfone reacts with -SH groups, forming a stable thioether linkage
- Conjugates prepared with vinylsulfone-reactive group form a single stereoisomer
- Unlike the maleimide active group, vinylsulfone is not subject to hydrolytic degradation in aqueous environments
- After modification of an amine-containing molecule with SVSB, the vinylsulfone intermediate can be stored for long periods without loss of sulfhydryl reactivity
- *Reactive groups:* vinylsulfone and NHS ester
- *Reactive toward:* sulfhydryl and amino groups
- Literature reference #'s 78-80 (page 214)

Ordering Information

Product #	Description	Pkg Size	U.S. Price
22358ZZ	**SVSB** (*N*-Succinimidyl-[4-vinylsulfonyl]benzoate)	50 mg	$107

TFCS

Amine-reactive cross-linker with a latent amino group available on demand.



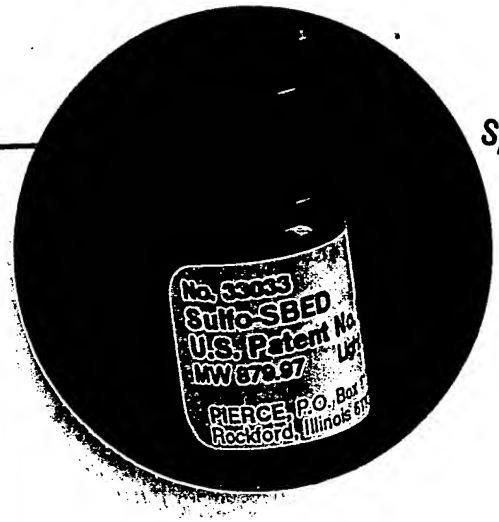
TFCS
M.W. 324.25
Spacer Arm 7.7 Å

Features/Benefits:

- Amine-reactive modification agent with a protected primary amine group
- NHS ester end couples with primary amines at pH 7-9 to form stable amide bonds
- Used to extend lysine side-chain length to reduce steric hindrance
- Temporarily block amine groups in target molecules
- Trifluoroacetyl protecting group released by phosphate or borate buffer, pH 7.8-8.1
- Unmasked amino group ready for reaction with any amine-reactive cross-linker for conjugate preparation
- Non-cleavable; water-insoluble
- *Reactive groups:* NHS ester and trifluoroacetyl-protected -NH_2
- *Reactive toward:* amino groups and NHS esters/Sulfo-NHS esters or EDC-activated carboxyl groups

Ordering Information

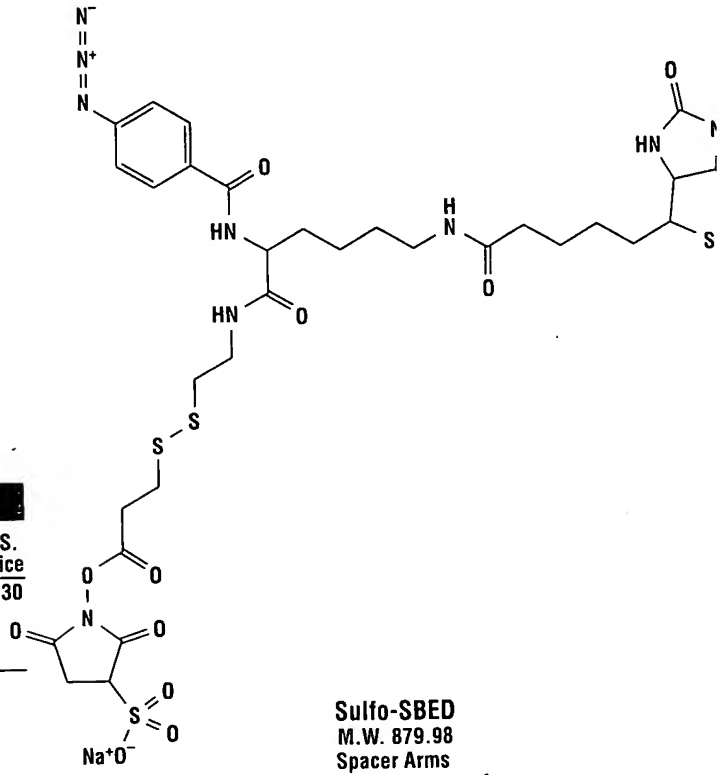
Product #	Description	Pkg Size	U.S. Price
22299ZZ	**TFCS** (*N*-[ε-Trifluoroacetylcaproyloxy] succinimide ester)	50 mg	$ 39



Special Product

Sulfo-SBED

A trifunctional Triple-Agent™ Cross-linker with a biotin handle – and it's cleavable too!



Sulfo-SBED
M.W. 879.98
Spacer Arms

Sulfo-NHS ester	13.7 Å
Phenyl azide	9.1 Å
Biotin	19.1 Å

Features/Benefits:

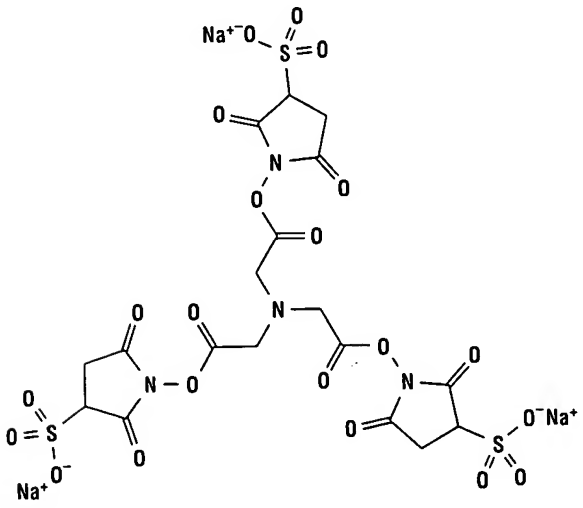
- Amine group-specific reactivity
- Nonspecific photoreactivity
- A biotin handle; thiol-cleavable
- Soluble in DMF, DMSO and MeOH
- Moisture and light sensitive
- *Reactive groups:* phenyl azide, Sulfo-NHS ester and biotin
- *Reactive toward:* amino groups and avidin/streptavidin/NeutrAvidin™ Biotin-Binding Protein
- Literature reference #'s 49, 50, 87, 91 (page 214)

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
33033ZZ	Sulfo-SBED (Sulfosuccinimidyl [2-6-(biotinamido)-2-(*p*-azidobenzamido)-hexanoamido]ethyl-1,3′-dithiopropionate)	10 mg	$130

Sulfo-TSAT

Water-soluble, amine-reactive agent for preparing trimeric aggregates.



Sulfo-TSAT
M.W. 788.49
Spacer Arm 4.2 Å

Features/Benefits:

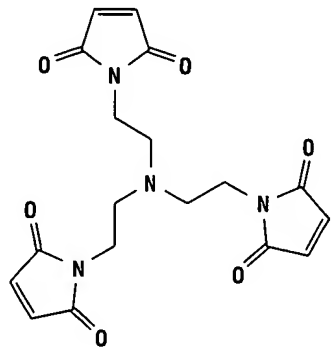
- Novel amine-reactive trifunctional cross-linking agent
- Sulfo-NHS ester couples to amines at pH 7-9 to form stable amide bonds
- Useful for the preparation of multicomponent aggregates
- Non-cleavable; water-soluble
- Literature in nearest neighbor studies
- Core molecule for the construction of dendritic polymers
- *Reactive group:* Sulfo-NHS ester
- *Reactive toward:* amino groups

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
33053ZZ	Sulfo-TSAT (*Tris*-sulfosuccinimidyl aminotriacetate)	50 mg	$123

TMEA

Sulfhydryl-reactive tool for preparing trimeric aggregates.



TMEA
M.W. 386.36
Spacer Arm 10.3 Å

Features/Benefits:

- Novel sulfhydryl-reactive trifunctional cross-linking agent
- Maleimides react with -SH groups at a pH of 6.5-7.5, forming stable thioether linkages
- Useful for the preparation of trimeric complexes of cysteine-containing peptides and other thiol-containing compounds
- Non-cleavable; water-insoluble
- Application in nearest neighbor studies
- Core molecule for the construction of dendritic polymers
- *Reactive group:* maleimide
- *Reactive toward:* sulfhydryl groups

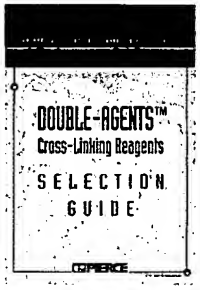
Ordering Information

Product #	Description	Pkg Size	U.S. Price
33043ZZ	TMEA (*Tris*-[2-maleimidoethyl]amine)	50 mg	$109

Cross-linking Reagent Buffer Scheme

Type of Cross-linker	Buffer
Imidoester	BupH™ Borate Buffer Packs, pH 8.5 (Product # 28384ZZ) or BupH™ Carbonate-Bicarbonate Buffer Packs, pH 9.0 (Product # 28382ZZ)
Homobifunctional NHS-Ester Cross-linking Buffer	BupH™ Phosphate Buffered Saline Packs, pH 7.2 (Product # 28372ZZ) or BupH™ Modified Dulbecco's Phosphate Buffered Saline Packs, pH 7.4 (Product # 28374ZZ)
Heterobifunctional NHS-Ester Maleimide	BupH™ Phosphate Buffered Saline Packs, pH 7.2 (Product # 28372ZZ) or BupH™ Modified Dulbecco's Phosphate Buffered Saline Packs, pH 7.4 (Product # 28374ZZ)
Carbodiimide	BupH™ MES Buffered Saline, pH 4.7 (Product # 28390ZZ)
EDC with NHS or Sulfo-NHS	BupH™ Phosphate Buffered Saline Packs, pH 7.2 (Product # 28372ZZ) or BupH™ Modified Dulbecco's Phosphate Buffered Saline Packs, pH 7.4 (Product # 28374ZZ)

Double-Agents™ Cross-Linking Reagents Selection Guide



Contact Pierce, the world leader in cross-linking reagents for life science applications, for a free copy of the ***Double-Agents™ Cross-Linking Reagents Selection Guide***. Written for both the novice and the expert, this guide helps you select the best reagent(s) based on your criteria and intended application. Having helped you narrow your choices, the guide provides other relevant information (molecular weight, spacer arm length, structure, etc.) to further help you select a reagent.

Ordering Information

Product #	Description
1600250	Double-Agents™ Cross-Linking Reagents Selection Guide

In a hurry to select a cross-linker? Log on to the Pierce web site at www.piercenet.com and use our online selection guide.

Pierce Cross-linkers at a Glance

Double-Agents™ Cross-linker Product # Acronym	Reactive Toward: -NH_2 Amines	-SH Sulfhydryls	Carbohydrates	Nonselective (photoreactive)	-COOH Carboxyls	-OH Hydroxyl	Cleavable By: Thiols	Base	Periodate	Hydroxylamine	Iodinatable: Yes	Iodinatable: No	Latent Functional Group
21509ZZ ABH			X	X								X	
22101ZZ AEDP	X				X		X					X	
22295ZZ AMAS	X	X										X	
21451ZZ ANB-NOS	X			X								X	
27720ZZ APDP		X		X			X				X		
20108ZZ APG				X								X	
21512ZZ ASBA				X	X						X		
21564ZZ BASED				X			X				X		
22331ZZ BMB		X										X	
22332ZZ BMDB		X							X			X	
22330ZZ BMH		X										X	
22323ZZ BMOE		X										X	
22296ZZ BMPA	X	X										X	
22297ZZ BMPH		X	X									X	
22298ZZ BMPS	X	X										X	
22336ZZ $BM[PEO]_3$		X										X	
22337ZZ $BM[PEO]_4$		X										X	
21600ZZ BSOCOES	X							X				X	
21580ZZ BS^3	X											X	
21525ZZ DFDNB	X											X	
20663ZZ DMA	X											X	
21666ZZ DMP	X											X	
20700ZZ DMS	X											X	
21702ZZ DPDPB		X					X					X	
20593ZZ DSG	X											X	
22585ZZ DSP	X						X					X	
21555ZZ DSS	X											X	
20589ZZ DST	X								X			X	
20665ZZ DTBP	X						X					X	
22335ZZ DTME		X					X					X	
21578ZZ DTSSP	X						X					X	
22980ZZ EDC	X				X							X	
21565ZZ EGS	X									X		X	
22306ZZ EMCA	X	X										X	
22106ZZ EMCH		X	X									X	
22308ZZ EMCS	X	X										X	
22309ZZ GMBS	X	X										X	
22334ZZ HBVS		X										X	
22211ZZ KMUA	X	X										X	
22111ZZ KMUH		X	X									X	
22362ZZ LC-SMCC	X	X										X	
21651ZZ LC-SPDP	X	X					X					X	
22311ZZ MBS	X	X										X	

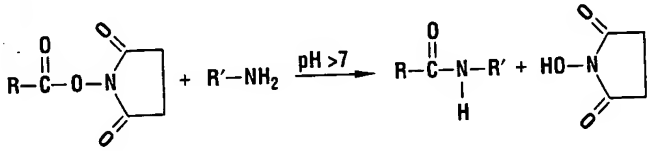
Double-Agents™ Cross-linker Product # Acronym	Reactive Toward						Cleavable By				Iodinatable		Latent Functional Group
	$-NH_2$ Amines	-SH Sulfhydryls	Carbohydrates	Nonselective (photoreactive)	-COOH Carboxyls	-OH Hydroxyl	Thiols	Base	Periodate	Hydroxylamine	Yes	No	
22303ZZ M_2C_2H		X	X									X	
22305ZZ MPBH		X	X									X	
22605ZZ MSA	X											X	
27714ZZ NHS-ASA	X			X								X	-COOH
22301ZZ PDPH		X	X				X				X		
28100ZZ PMPI		X				X						X	
21533ZZ SADP	X			X			X					X	
33030ZZ SAED	X			X			X					X	
21549ZZ SAND	X			X			X					X	
22600ZZ SANPAH	X			X			X					X	
27716ZZ SASD	X			X								X	
26102ZZ SATA	X	X					X				X		
26100ZZ SATP	X	X										X	-SH
22339ZZ SBAP	X	X										X	-SH
27719ZZ SFAD	X			X			X					X	
22349ZZ SIA	X	X										X	
22329ZZ SIAB	X	X										X	
22360ZZ SMCC	X	X										X	
22416ZZ SMPB	X	X										X	
22363ZZ SMPH	X	X										X	
21558ZZ SMPT	X	X										X	
21857ZZ SPDP	X	X					X					X	
21556ZZ Sulfo-BSOCOES	X						X					X	
20591ZZ Sulfo-DST	X							X				X	
21566ZZ Sulfo-EGS	X								X			X	
22307ZZ Sulfo-EMCS	X	X								X		X	
22324ZZ Sulfo-GMBS	X	X										X	
21563ZZ Sulfo-HSAB	X			X								X	
21111ZZ Sulfo-KMUS	X	X										X	
21650ZZ Sulfo-LC-SPDP	X	X										X	
22312ZZ Sulfo-MBS	X	X					X					X	
27735ZZ Sulfo-NHS-LC-ASA	X			X								X	
21553ZZ Sulfo-SADP	X			X							X		
22589ZZ Sulfo-SANPAH	X			X			X					X	
22327ZZ Sulfo-SIAB	X	X										X	
22322ZZ Sulfo-SMCC	X	X										X	
22317ZZ Sulfo-SMPB	X	X										X	
21568ZZ Sulfo-LC-SMPT	X	X										X	
33033ZZ Sulfo-SBED*	X						X					X	
33053ZZ Sulfo-TSAT**	X			X			X					X	
22358ZZ SVSB	X	X										X	
22299ZZ TFCS	X											X	
33043ZZ TMEA**		X			X								$-NH_2$
												X	

*Trifunctional cross-linking reagent; binds to Avidin, Streptavidin and NeutrAvidin™ Biotin-Binding Protein.

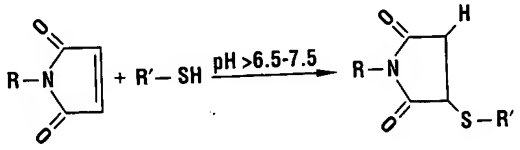
**Trifunctional cross-linking agent.

Active Group Reaction Schemes

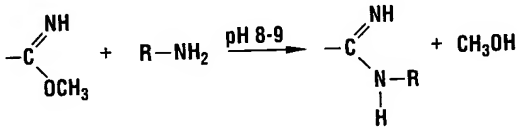
NHS-Ester Reaction Scheme



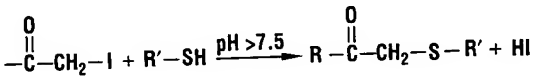
Maleimide Reaction Scheme



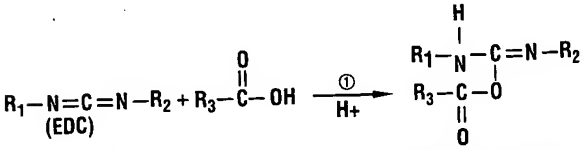
Imidoester Reaction Scheme



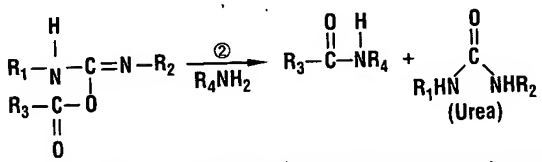
Active Halogen Reaction Scheme



EDC Coupling Reaction Scheme

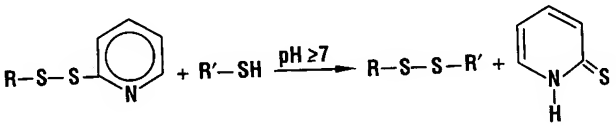


EDC reacts with carboxylic acid group and activates the carboxyl group, allowing it to be coupled to the amino group (R_4NH_2) in the reaction mixture.



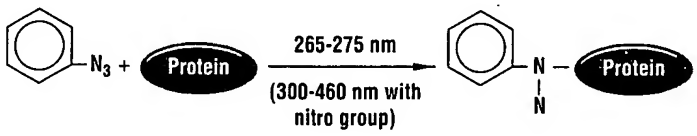
EDC is released as a soluble urea derivative after displacement by the nucleophile, R_4NH_2.

Pyridyl Disulfide Reaction Scheme

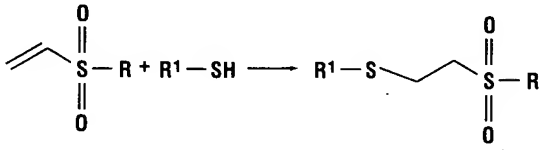


Active Group Reaction Schemes

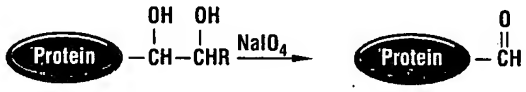
Azidophenyl Photolysis



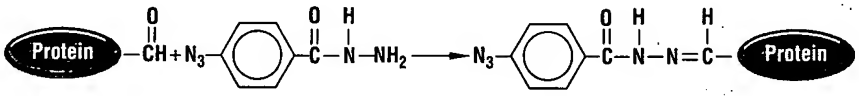
Vinyl-Sulfone Reaction Scheme



Hydrazide Reaction Scheme



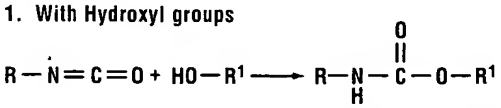
The oxidation of a Protein Carbohydrate (*cis*-diol) to an aldehyde.



ABH, or Azidobenzoyl Hydrazide, reacts with the aldehyde on the protein to form an arylazide activated protein.

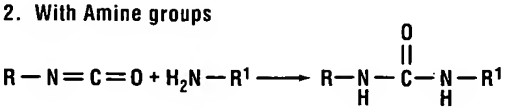
Isocyanate Reaction Schemes

1. With Hydroxyl groups



Carbamate Linkage

2. With Amine groups

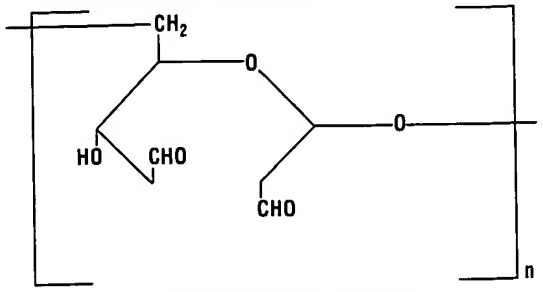


Isourea Linkage

Activated Dextran Coupling Kits

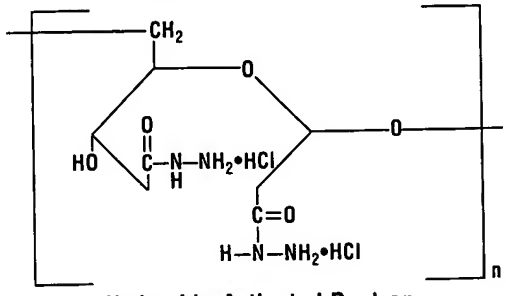
Novel water-soluble reagents capable of multimeric aggregate formation.

Couple amine-containing ligands and biomolecules



Aldehyde-Activated Dextran
Average M.W. (dextran) 40 kD

Couple aldehyde- or carboxyl-containing ligands and biomolecules



Hydrazide-Activated Dextran
Average M.W. (dextran) 40 kD

Potential Applications:

- Coupling both high and low molecular weight biomolecules to a single soluble matrix
- Serving as a water-soluble scavenger of proteases from cell preparations
- Isolating a target antigen from solution containing dextran-coupled antibodies
- Isolating a target antibody from solution via a specific ligand
- Stabilizing enzymes for research or process-level applications
- Forming antibody-enzyme conjugates for use in immuno-assay development
- Preparing immunoconjugates
- Acting as a poly-functional cross-linking agent to capture multicomponent systems
- Improving the solubility properties of isolated membrane proteins

Reference

1. Mallia, A.K. and Vigna, R.A. (1998). Nonimmunogenic-activated carriers: aldehyde-activated and hydrazide-activated dextran. *Previews* **1(4)**, 16-17.

Ordering Information

Product #	Description	Pkg Size	U.S. Price
20890ZZ	**Aldehyde-Activated Dextran Coupling Kit** Includes: Aldehyde-Activated Dextran* [CHO Loading: ~300 moles/ mole of dextran] Sodium Cyanoborohydride BupH™ Phosphate Buffered Saline	Kit 5 x 5 mg 190 mg 1 pack	$ 97
20900ZZ	**Hydrazide-Activated Dextran Coupling Kit** Includes: Hydrazide-Activated Dextran* [Hydrazide Loading: 1-2 µmoles hydrazide/mg dextran] Sodium Cyanoborohydride BupH™ Phosphate Buffered Saline	Kit 5 x 5 mg 190 mg 1 pack	$127

**The average molecular weight of dextran used in these preparations is 40 kD.*

Compatible Products

22980ZZ	**EDC** (1-Ethyl-3-[3-Dimethylaminopropyl] carbodiimide Hydrochloride)	5 gm	$ 61
22981ZZ	**EDC**	25 gm	$198
28372ZZ	**BupH™ Phosphate Buffered Saline Packs** *Each pack yields 500 ml of 0.1 M phosphate, 0.15 M NaCl, pH 7.2 when dissolved in 500 ml of distilled water.*	40 packs	$ 83
44892ZZ	**AminoLink® Reductant** (Sodium Cyanoborohydride)	2 gm	$ 25

Pierce Cross-linking Reagent Literature References

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